Technology Development News

Exploring The State Of The Art For The State Of The Practice

WESTERN FEDERAL LANDS HIGHWAY DIVISION

JULY **1999**

Alternative Fuel Vehicles

by Richard G. Wasill and Jodi S. Chew

Richard Wasill, Program Planning & Administration Engineer, and Jodi Chew, Transportation Planning Engineer, recently attended a conference titled *National Parks: Transportation Alternatives and Advanced Technology for the 21st Century*. The conference was well-attended, with participants from the Federal Highway Administration, State Departments of Transportation, National Parks, Federal Transit Administration, U.S. Fish and Wildlife Service, and Department of Energy. The event was hosted by the Western Transportation Institute (WTI), an institute affiliated with Montana State University and active in the promotion and implementation of advanced rural Intelligent Transportation Systems in the greater Yellowstone corridor.

The program agenda announced topics that were quite different from those found at a typical highway conference. There were no presentations about highway capacity or design standards; instead, the presentations focused on employing technology and transportation alternatives to address the growing visitor and vehicle demand being placed on National Parks. Coordination and integrated State/Park/community planning were also emphasized throughout the conference as WTI stressed that the National Parks are not "islands" and that transportation **systems** do not abruptly end at jurisdictional boundaries.

We have all heard that Park visitation is increasing, and this means Park traffic is increasing as well, leading to congestion and pollution concerns for many of our National Parks. We also realize that the roads in the National Parks are established and in many cases are part of the historical context, and we cannot just pave our way out of the situation. Therefore, alternative forms of transportation, alternative management strategies, and alternative fuel vehicles are all being explored as potential solutions to the Parks' dilemma of being loved to death.

A significant part of this conference was devoted to alternative fuel vehicles. Auto manufacturers such as Ford, Chevrolet, Dodge, Honda, and Toyota displayed and demonstrated alternate fuel vehicles. Most of the manufacturers are currently producing hybrid vehicles. Hybrids are vehicles that can operate on two types of fuels (for example, gasoline and propane, or gasoline and electricity). However, to illustrate that "pure" alternate fuel vehicles are viable, the audience was informed that a Kenworth truck was successfully run for 200,000 miles on a bio-diesel mixture and that Yellowstone National Park has been operating a 1995, standard, 4-wheel drive, diesel Dodge pickup for over 100,000 miles on canola vegetable oil. There was surprisingly little engine wear reported on the pickup after the 100,000 miles of use, and luckily, no problem with Yellowstone bears being attracted to the canola oil.

The Department of Energy (DOE) also shared their agency's mission and information about legislation and executive orders enacted to promote energy conservation and air quality. For pure economy, fossil fuel is still hard to beat. However, concerns about air quality and the looming possibility that fossil fuel will one day be exhausted, have led to research and development of alternative fuels. The DOE explained that a part of the 1992 legislation titled The Energy Policy of 1992 mandated that 75% of new Federal vehicle fleet purchases be alternative fuel vehicles. This requirement came as quite a surprise to the majority of attendees, including Richard!

So.....the first thing Richard did upon his return to Western Federal Lands Highway Division (WFLHD) was to access the DOE website @ *http://www.fleets.doe.gov/* to assess how these regulations applied to WFLHD. Richard learned that if you have more than 20 vehicles and your agency is located in an area where refueling facilities are available, you must comply. The majority of WFLHD vehicles are utilized by our construction personnel and are located at remote sites where there are no alternate fuel stations and the vehicles used by the WFLHD office personnel number less than 20. Therefore, WFLHD vehicles are exempt. However, GSA has been arranging for some of their customers to use alternative fuel vehicles, since the Veterans Administration Hospital in Vancouver is identified as an alternative fuel refueling station and a good portion of WFLHD office travel is within the Salem-Portland-Seattle area. Rik Apling, in Property and Supply, requested an alternative fueled vehicle in the Spring of 1998. The 1999 Ford Contour Alternative Fueled vehicle was received in the Spring of 1999.

Greg Humphreys, WFLHD Environmental Specialist, recently drove the new Ford Contour to Salem, Oregon. During the trip, the hybrid vehicle automatically switched from natural gas to gasoline without any hitch or hesitation. Greg reported there was no notable change in the vehicle's performance while it was running on natural gas. Monthly and mileage charges through GSA for alternative fuel vehicles are the same as gasoline vehicles. Rik Apling predicts that our office fleet in the future will consist of more alternative fuel vehicles.

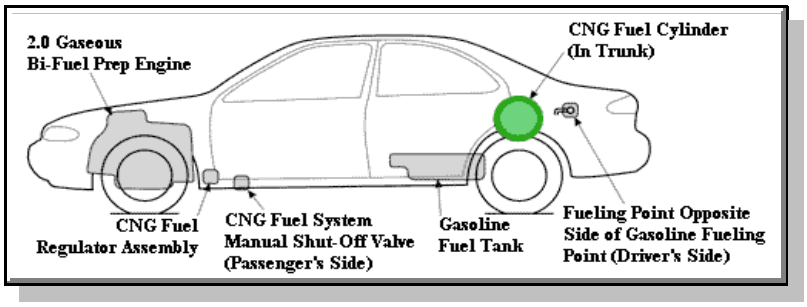
The DOE Alternative Fuels Data Center @ *http://www.afdc.nrel.gov/refueling.html* lists refueling site locations (stations) for compressed natural gas (CNG), 85% methanol and 15% gasoline (M85), 85% ethanol and 15% gasoline (E85), liquefied petroleum gas (LPG), and liquefied natural gas (LNG), as well as electric charging stations throughout the United States.

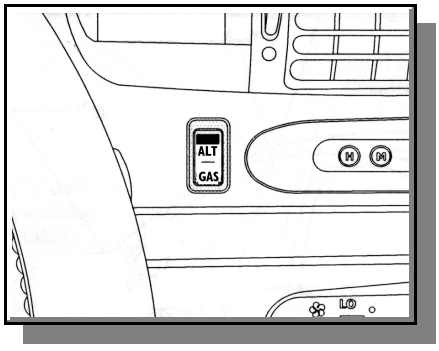
The number and type of current refueling sites in Washington and Oregon are summarized below:

STATE	M85 *Methanol*	CNG *Compressed Natural Gas*	E85 *Ethenol*	LPG *Liquefied Petroleum Gas*	Electric	LNG *Liquefied Natural Gas*	All
Washington	1	28	0	82	6	1	118
Oregon	0	9	0	25	0	1	35

The Contour passenger car is equipped with one 15" x 32" tank to contain the Compressed Natural Gas. A "Quick Fill" can be completed within minutes, filling the tank to 50% of the total capacity. A "Slow-Fill" requires approximately 4 hours to fill the tank to 100% capacity. The chart below gives the fill equivalent gasoline volume and approximate range in miles.

Volume Gallons (Liters)	Range Miles (Kilometers)
4.21 - 4.8 (15.5 L - 18.2 L)	69-110 (111 Km- 177 Km)

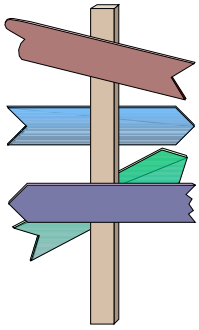




Prior to starting the vehicle, the driver must determine which fuel mode to operate in. There is a toggle switch located in the dashboard above the center console. When the switch is placed in the ALT position and the indicator light is on, Natural Gas is selected. The fuel gauge will read the amount of Natural Gas on-board. If the switch is place in the GAS position, gasoline operation is selected and the fuel gauge reads the amount of gasoline on-board. The fuel selection switch has no effect when the vehicle is operating. The vehicle must be stopped and the key in the OFF position before the fuel mode can be selected. The vehicle will automatically switch to gasoline mode when the natural gas runs low during vehicle operation. The system will NOT automatically switch to natural gas if the gasoline level runs low.

Want to try it out? If you're a Western Federal Lands employee going to Portland, Salem or Seattle you might want to drive the 1999 blue Ford Contour sedan and experience new technology at your fingertips.

ROAD SIGNS



"Try a thing you haven't done three times. Once to get over the fear of doing it. Twice to learn how to do it . And a third time, to figure out whether you like it or not."

--Virgil Thomson (advice given at age 93)

We wish to thank all the individuals who have contributed articles for previous newsletters. If you are aware of a new technology, (or a fresh spin on an old one) please jot down your ideas and submit them via e-mail to me at the address below. Or, if you have an aversion to writing, just donate 15 minutes of your time for an interview (either by phone or in person), and I'll format the information for you. You can then review the article for accuracy (via e-mail or hard copy) and upon publication, you'll become famous in a matter of days. Remember, although we cater to road-related technology, ANY new technology information is welcome.

Please send all submissions to Kristi Swisher - (360.696.7572). Be sure your name, title, and phone number are the way you want them to appear in the article. Articles are subject to editor/ layout approval and may be condensed if space is limited.

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